

Free ebook Control of electrical drives 3rd edition [PDF]

Control of Electrical Drives Advanced Electrical Drives Fundamentals of Electrical Drives Fundamentals of Electrical Drives Electrical Machine Drives Control Digital Control of Electrical Drives Electric Drives A First Course on Electrical Drives New Applications of Electric Drives Applied Control of Electrical Drives ELECTRIC DRIVES Fundamentals of Electrical Drives Electric Machines and Electric Drives Electrical Drives Dynamics and Control of Electrical Drives Control of Electrical Drives Electrical Machines and Drives Electric Drives Electric Machines and Drives Control Of Electrical Drives, 3E Fundamentals of Electrical Drives Modeling, Simulation and Control of Electrical Drives Digital Control of Electric Drives Basics of Electrical Drives Control of Electrical Drives Advanced Control of Electrical Drives and Power Electronic Converters Introduction to Electric Power and Drive Systems Advanced Electrical Drives Electric Motors and Drives Modern Electrical Drives Recent Developments of Electrical Drives Fundamentals of Electrical Drives Analysis and Control of Electric Drives Electrical Drives for Direct Drive Renewable Energy Systems Digital Control of Electrical Drives Basics of Electrical Drives PID and Predictive Control of Electrical Drives and Power Converters using MATLAB / Simulink Chaos in Electric Drive Systems Electric Drives: Concepts & Appl, 2/E Electric Drives and Electromechanical Systems

Control of Electrical Drives

2001-08-10

electrical drives play an important role as electromechanical energy converters in transportation material handling and most production processes the ease of controlling electrical drives is an important aspect for meeting the increasing demands by the user with respect to flexibility and precision caused by technological progress in industry as well as the need for energy conservation at the same time the control of electrical drives has provided strong incentives to control engineering in general leading to the development of new control structures and their introduction to other areas of control this is due to the stringent operating conditions and widely varying specifications a drive may alternately require control of torque acceleration speed or position and the fact that most electric drives have in contrast to chemical or thermal processes well defined structures and consistent dynamic characteristics during the last years the field of controlled electrical drives has undergone rapid expansion due mainly to the advances of semiconductors in the form of power electronics as well as analogue and digital signal electronics eventually culminating in microelectronics and microprocessors the introduction of electronically switched solid state power converters has renewed the search for adjustable speed ac motor drives not subject to the limitations of the mechanical commutator of dc drives which dominated the field for a century

Advanced Electrical Drives

2010-11-30

electrical drives convert in a controlled manner electrical energy into mechanical energy electrical drives comprise an electrical machine i.e. an electro mechanical energy converter a power electronic converter i.e. an electrical to electrical converter and a controller communication unit today electrical drives are used as propulsion systems in high speed trains elevators escalators electric ships electric forklift trucks and electric vehicles advanced control algorithms mostly digitally implemented allow torque control over a high bandwidth hence precise motion control can be achieved examples are drives in robots pick and place machines factory automation hardware etc most drives can operate in motoring and generating mode wind turbines use electrical drives to convert wind energy into electrical energy more and more variable speed drives are used to save energy for example in air conditioning units compressors blowers pumps and home appliances key to ensure stable operation of a drive in the aforementioned applications are torque control

algorithms in advanced electrical drives a unique approach is followed to derive model based torque controllers for all types of lorentz force machines i e dc synchronous and induction machines the rotating transformer model forms the basis for this generalized modeling approach that ultimately leads to the development of universal field oriented control algorithms in case of switched reluctance machines torque observers are proposed to implement direct torque algorithms from a didactic viewpoint tutorials are included at the end of each chapter the reader is encouraged to execute these tutorials to familiarize him or herself with all aspects of drive technology hence advanced electrical drives encourages learning by doing furthermore the experienced drive specialist may find the simulation tools useful to design high performance controllers for all sorts of electrical drives

Fundamentals of Electrical Drives

2002-06-13

encouraged by the response to the first edition and to keep pace with recent developments fundamentals of electrical drives second edition incorporates greater details on semi conductor controlled drives includes coverage of permanent magnet ac motor drives and switched reluctance motor drives and highlights new trends in drive technology contents were chosen to satisfy the changing needs of the industry and provide the appropriate coverage of modern and conventional drives with the large number of examples problems and solutions provided fundamentals of electrical drives second edition will continue to be a useful reference for practicing engineers and for those preparing for engineering service examinations

Fundamentals of Electrical Drives

2016-06-10

the purpose of this book is to familiarize the reader with all aspects of electrical drives it contains a comprehensive user friendly introductory text

Electrical Machine Drives Control

2016-11-14

this comprehensive text examines existing and emerging electrical drive technologies the authors clearly define the most basic electrical drive concepts and go on to explain the most important details while maintaining a solid connection to the theory and design of the associated electrical machines also including links to a number of industrial applications the authors take their investigation of electrical drives beyond theory to examine a number of practical aspects of electrical drive control and application key features provides a comprehensive summary of all aspects of controlled speed electrical drive technology including control and operation handling of electrical drives is solidly linked to the theory and design of the associated electrical machines added insight into problems and functions are illustrated with clearly understandable figures offers an understanding of the main phenomena associated with electrical machine drives considers the problem of bearing currents and voltage stresses of an electrical drive includes up to date theory and design guidelines taking into account the most recent advances this book s rigorous coverage of theoretical principles and techniques makes for an excellent introduction to controlled speed electrical drive technologies for electrical engineering msc or phd students studying electrical drives it also serves as an excellent reference for practicing electrical engineers looking to carry out design analyses and development of controlled speed electrical drives

Digital Control of Electrical Drives

2007-08-22

provides broad insights into problems of coding control algorithms on a dsp platform includes a set of simulink simulation files source codes which permits readers to envisage the effects of control solutions on the overall motion control system bridges the gap between control analysis and industrial practice

Electric Drives

2016-09-15

electric drives provides a practical understanding of the subtleties involved in the operation of modern electric drives the third edition of this bestselling textbook has been fully updated and greatly expanded to incorporate the latest technologies used to save energy and increase productivity stability and reliability every phrase equation number and reference in the text has been revisited with the necessary changes made throughout in addition new references to key research and development activities have been included to accurately reflect the current state of the art nearly 120 new pages covering recent advances such as those made in the sensorless control of a c motor drives have been added as have two new chapters on advanced scalar control and multiphase electric machine drives all solved numerical examples have been retained and the 10 matlab simulink programs remain online thus electric drives third edition offers an up to date synthesis of the basic and advanced control of electric drives with ample material for a two semester course at the university level

A First Course on Electrical Drives

1989

the aim of revision is mainly to acquaint the students with the recent trends in the development of electric motors used as prime movers in electric drive systems the chapter on introduction to solid state controlled drives has been expanded to include sections on increasingly used brushless dcmotors and switched reluctance motors a separate chapter on the more commonly used position control drive motors namely stepper motors has been also incorporated the drives used in the fast growing petroleum industry have been included in the chapter on industrialapplications

New Applications of Electric Drives

2015-12-09

in the last few decades electric drives have found their place in a considerable number of diverse applications they are successfully replacing some other traditional types of drives owing to their better performance and excellent controllability the introduction of electric drives is in most cases also beneficial from the ecological point of view as they are not directly dependent on fossil fuels and an increasing part of electric energy they consume is generated in renewable energy sources this book focuses on applications of electric drives that emerged only recently and or novel aspects that appear in them particular attention is given to using electric drives in vehicles aircraft non road mobile machinery and hvac systems

Applied Control of Electrical Drives

2015-09-17

provides an overall understanding of all aspects of ac electrical drives from the motor and converter to the implemented control algorithm with minimum mathematics needed demonstrates how to implement and debug electrical drive systems using a set of dedicated hardware platforms motor setup and software tools in vissimtm and plecstm no expert programming skills required allowing the reader to concentrate on drive development enables the reader to undertake real time control of a safe low voltage and low cost experimental drive this book puts the fundamental and advanced concepts behind electric drives into practice avoiding involved mathematics whenever practical this book shows the reader how to implement a range of modern day electrical drive concepts without requiring in depth programming skills it allows the user to build and run a series of ac drive concepts ranging from very basic drives to sophisticated sensorless drives hence the book is the only modern resource available that bridges the gap between simulation and the actual experimental environment engineers who need to implement an electrical drive or transition from sensed to sensorless drives as well as students who need to understand the practical aspects of working with electrical drives will greatly benefit from this unique reference

ELECTRIC DRIVES

1999-01-01

this book provides a comprehensive introduction to the fundamental concepts of electric drives and is eminently suited as a textbook for

b e b tech amie and diploma courses in electrical engineering it can also be used most effectively by all those preparing for gate and upsc competitive examinations as well as by practising engineers the topics which range from principles and techniques to industrial applications include characteristic features of drives methods of braking and speed control electromagnetic and solid state control of motors motor ratings transients in drive systems and operation of stepper motors

Fundamentals of Electrical Drives

2001

suitable for undergraduate and postgraduate courses in electrical drives this book covers topics on dynamics and control of electrical drives selection of motor power rating dc induction and synchronous motor drives stepper motor and switched reluctance motor drives permanent magnet ac and brushless dc motor drives and more

Electric Machines and Electric Drives

2013-09

from the point of view of a user this book covers all aspects of modern electrical drives it is aimed at both users who wish to understand design use and maintain electrical drives as well as specialists technicians engineers and students who wish to gain a comprehensive overview of electrical drives jens weidauer and richard messer describe the principles of electrical drives their design and application through to complex automation solutions in the process they introduce the entire spectrum of drive solutions available and their main applications a special aspect is the combination of multiple drives to form a drive system as well as the integration of drives into automation solutions in simple and clear language and supported with many diagrams complex relationships are described and presented in an easy to understand way the authors deliberately avoid a comprehensive mathematical treatment of their subject and instead focus on a coherent description of the active principles and relationships as a result the reader will be in a position to understand electrical drives as a whole and to solve drive related problems in everyday professional life

Electrical Drives

2014-07-07

dynamics is a science concerned with movement and changes in the most general approach it relates to life processes as well as behavior in nature in rest it governs small particles technical objects conversion of matter and materials but also concerns people groups of people in their individual and in particular social dimension in dynamics we always have to do with causes or stimuli for motion the rules of reaction or behavior and its result in the form of trajectory of changes this book is devoted to dynamics of a wide class of specific but very important objects such as electromechanical systems this is a very rigorous discipline and has a long tradition as its theoretical bases were formulated in the first half of the xix century by d alembert lagrange hamilton maxwell and other prominent scientists but their crucial results were based on previous pioneering research of others such as copernicus galileo newton this book in its theoretical foundations is based on the principle of least action which governs classical as well as relativistic mechanics and electromagnetism and leads to lagrange s equations which are applied in the book as universal method to construct equations of motion of electromechanical systems it gives common and coherent grounds to formulate mathematical models for all lumped parameters electromechanical systems which are vital in our contemporary industry and civilized everyday life from these remarks it seems that the book is general and theoretical but in fact it is a very practical one concerning modern electrical drives in a broad sense including electromechanical energy conversion induction motor drives brushless dc drives with a permanent magnet excitation and switched reluctance machines srm and of course their control which means shaping of their trajectories of motion using modern tools their designed autonomy in keeping a track according to our programmed expectations the problems presented in the book are widely illustrated by characteristics trajectories dynamic courses all computed by use of developed simulation models throughout the book there are some classical subjects and the history of the discipline is discussed but finally all modern tools and means are presented and applied more detailed descriptions follow in abstracts for the particular chapters the author hopes kind readers will enjoy and profit from reading this book

Dynamics and Control of Electrical Drives

2011-04-28

electrical drives play an important part as electromechanical energy converters in transportation materials handling and most production

processes this book presents a unified treatment of complete electrical drive systems including the mechanical parts electrical machines and power converters and control since it was first published in 1985 the book has found its way onto many desks in industry and universities all over the world for the second edition the text has been thoroughly revised and updated with the aim of offering the reader a general view of the field of controlled electrical drives which are maintaining and extending their importance as the most flexible source of controlled mechanical energy

Control of Electrical Drives

2012-12-06

this book aims to offer a thorough study and reference textbook on electrical machines and drives the basic idea is to start from the pure electromagnetic principles to derive the equivalent circuits and steady state equations of the most common electrical machines in the first parts although the book mainly concentrates on rotating field machines the first two chapters are devoted to transformers and dc commutator machines the chapter on transformers is included as an introduction to induction and synchronous machines their electromagnetics and equivalent circuits chapters three and four offer an in depth study of induction and synchronous machines respectively starting from their electromagnetics steady state equations and equivalent circuits are derived from which their basic properties can be deduced the second part discusses the main power electronic supplies for electrical drives for example rectifiers choppers cycloconverters and inverters much attention is paid to pwm techniques for inverters and the resulting harmonic content in the output waveform in the third part electrical drives are discussed combining the traditional rotating field and dc commutator electrical machines treated in the first part and the power electronics of part two field orientation of induction and synchronous machines are discussed in detail as well as direct torque control in addition also switched reluctance machines and stepping motors are discussed in the last chapters finally part 4 is devoted to the dynamics of traditional electrical machines also for the dynamics of induction and synchronous machine drives the electromagnetics are used as the starting point to derive the dynamic models throughout part 4 much attention is paid to the derivation of analytical models but of course the basic dynamic properties and probable causes of instability of induction and synchronous machine drives are discussed in detail as well with the derived models for stability in the small as starting point in addition to the study of the stability in the small a chapter is devoted to large scale dynamics as well e g sudden short circuit of synchronous machines the textbook is used as the course text for the bachelor s and master s programme in electrical and mechanical engineering at the faculty of engineering and architecture of ghent university parts 1 and 2 are taught in the basic course fundamentals

of electric drives in the third bachelor part 3 is used for the course controlled electrical drives in the first master while part 4 is used in the specialised master on electrical energy

Electrical Machines and Drives

2018-01-20

electric motors are widely used in both industrial equipment and consumer products but motors are only one component in systems called drives this text provides information on both conventional as well as converter based drives and discusses the closed loop control and dynamics of drives

Electric Drives

1996

mohan s electric machines and drives is part of a three book series designed for the power sequence electives on electrical engineering the book focuses on power topics including advances in hybrid electric cars and alternative energy systems coupled with severe environmental problems associated with hydrocarbon based fuels the text builds off mohan s successful mnpere titles and adopts a systems approach

Electric Machines and Drives

2012-01-03

the purpose of this book is to familiarize the reader with all aspects of electrical drives it contains a comprehensive user friendly introductory text

Control Of Electrical Drives, 3E

2006-08-01

thanks to advances in power electronics device design digital signal processing technologies and energy efficient algorithms ac motors have become the backbone of the power electronics industry variable frequency drives vfd s together with ie3 and ie4 induction motors permanent magnet motors and synchronous reluctance motors have emerged as a new generation of greener high performance technologies which offer improvements to process and speed control product quality energy consumption and diagnostics analytics primarily intended for professionals and advanced students who are working on sensorless control predictive control direct torque control speed control and power quality and optimisation techniques for electric drives this edited book surveys state of the art novel control techniques for different types of ac machines the book provides a framework of different modeling and control algorithms using matlab simulink and presents design simulation and experimental verification techniques for the design of lower cost and more reliable and performant systems

Fundamentals of Electrical Drives

2007-06-14

the electromechanical systems employed in different branches of industry are utilized most often as drives of working machines which must be fed with electric energy in a continuous periodic or even discrete way some of these machines operate at constant speed others require wide and varying energy control in many designs the synchronous cooperation of several electric drives is required in addition to the desired dynamic properties for these reasons the control of the cooperation and dynamics of electromechanical systems requires the use of computers this book adopts an unusual approach to the subject in that it treats the electric drive system on the one hand as an element of a control system and on the other as an element of a complex automatic system these two trends in the development of the automatic control of electric drives have resulted in a volume that provides a thorough overview on the variety of different approaches to the design of control systems

Modeling, Simulation and Control of Electrical Drives

2019-07-27

in this book fundamentals of electrical drives are discussed keeping in mind the students of electrical engineering dynamics of electrical drives characteristics of dc and ac motors while starting running and braking determination of rating and heating of motors are described in detail drives used in various industries are discussed in a separate chapter industrial applications solved examples and problems are given at the end of most of the chapters the book acquaints the students with the recent trends in the development of electric motors used as prime movers in electric drive systems the chapter on introduction to solid state controlled drives has been expanded to include sections on increasingly used brushless dc motors and switched reluctance motors a separate chapter on the more commonly used position control drive motors namely stepper motors has been also incorporated amazon in

Digital Control of Electric Drives

2013-10-22

electrical drives play an important role as electromechanical energy converters in transportation and most production processes the ease of controlling electrical drives is an important aspect for meeting the increasing demands by the user with respect to flexibility and precision caused by technological progress in industry conversely the control of electrical drives has in the past provided strong incentives to control engineering in general leading to the development of new other areas of control this is due to control structures and their introduction to stringent operating conditions and widely varying specifications a drive may alternately require control of torque acceleration speed or position and the fact that most electric drives have in contrast to chemical or thermal processes well defined structures and consistent dynamic characteristics during the last few years the field of controlled electrical drives has experienced rapid expansion caused mainly by the advances of semiconductors in the form of power electronics as well as analogue and digital signal electronics eventually culminating in microelectronics and microprocessors the introduction of electronically switched solid state power converters has renewed the search for ac motor drives not subject to the limitations of the mechanical commutator of dc drives this has created new and difficult control problems

Basics of Electrical Drives

2015

this contributed volume is written by key specialists working in multidisciplinary fields in electrical engineering linking control theory power electronics artificial neural networks embedded controllers and signal processing the authors of each chapter report the state of the art of the various topics addressed and present results of their own research laboratory experiments and successful applications the presented solutions concentrate on three main areas of interest motion control in complex electromechanical systems including sensorless control fault diagnosis and fault tolerant control of electric drives new control algorithms for power electronics converters the chapters and the complete book possess strong monograph attributes important practical and theoretical problems are deeply and accurately presented on the background of an exhaustive state of the art review many results are completely new and were never published before well known control methods like field oriented control foc or direct torque control dtc are referred as a starting point for modifications or are used for comparison among numerous control theories used to solve particular problems are nonlinear control robust control adaptive control lyapunov techniques observer design model predictive control neural control sliding mode control signal filtration and processing fault diagnosis and fault tolerant control

Control of Electrical Drives

1985

an introduction to the analysis of electric machines power electronic circuits electric drive performance and power systems this book provides students with the basic physical concepts and analysis tools needed for subsequent coursework in electric power and drive systems with a focus on tesla s rotating magnetic field organized in a flexible format it allows instructors to select material as needed to fit their school s power program the first chapter covers the fundamental concepts and analytical methods that are common to power and electric drive systems the subsequent chapters offer introductory analyses specific to electric machines power electronic circuits drive system performance and simulation and power systems in addition this book provides students with an analytical base on which to build in advanced follow on courses examines fundamental power conversions dc dc ac dc and dc ac harmonics and distortion describes the dynamic computer simulation of a brushless dc drive to illustrate its performance with both a sinusoidal inverter voltage approximation

and more realistic stator six step drive applied voltages includes in chapter short problems numerous worked examples and end of chapter problems to help readers review and more fully understand each topic

Advanced Control of Electrical Drives and Power Electronic Converters

2016-09-30

this book provides a unique approach to derive model based torque controllers for all types of lorentz force machines i e dc synchronous and induction machines the rotating transformer model forms the basis for the generalized modeling approach of rotating field machines which leads to the development of universal field oriented control algorithms contrary to this direct torque control algorithms using observer based methods are developed for switched reluctance machines tutorials are included at the end of each chapter and the reader is encouraged to execute these tutorials in order to gain familiarity with the dynamic behavior of drive systems this updated edition uses plects simulation and vector processing tools that were specifically adopted for the purpose of these hands on tutorials hence advanced electrical drives encourages learning by doing and the experienced drive specialist may find the simulation tools useful to design high performance torque controllers although it is a powerful reference in its own right when used in conjunction with the companion texts fundamentals of electrical drives and applied control of electrical drives this book provides a uniquely comprehensive reference set that takes readers all the way from understanding the basics of how electrical drives work to deep familiarity with advanced features and models to a mastery of applying the concepts to actual hardware in practice teaches readers to perform insightful analysis of ac electrical machines and drives introduces new modeling methods and modern control techniques for switched reluctance drives updated to use plects simulation tools for modeling electrical drives including new and more experimental results numerous tutorials at end of each chapter to learn by doing step by step includes extra material featuring build and play lab modules for lectures and self study

Introduction to Electric Power and Drive Systems

2017-02-08

written for non specialist users of electric motors and drives this book explains how electric drives work and compares the performance of the main systems with many examples of applications the author s approach using a minimum of mathematics has made this book

equally popular as an outline for professionals and an introductory student text first edition 1990 has sold over 6000 copies drives and controls on the first edition this book is very readable up to date and should be extremely useful to both users and o e m designers i unhesitatingly recommend it to any busy engineer who needs to make informed judgements about selecting the right drive system new features of the second edition new section on the cycloconverter drive more on switched reluctance motor drives more on vector controlled induction motor drives more on power switching devices new question and answer sections on common problems and misconceptions updating throughout electric motors and drives is for non specialist users of electric motors and drives it fills the gap between specialist textbooks which are pitched at a level which is too academic for the average user and the more prosaic handbooks which are filled with useful detail but provide little opportunity for the development of any real insight or understanding the book explores most of the widely used modern types of motor and drive including conventional and brushless d c induction motors mains and inverter fed stepping motors synchronous motors mains and converter fed and reluctance motors

Advanced Electrical Drives

2020-08-21

electrical drives lie at the heart of most industrial processes and make a major contribution to the comfort and high quality products we all take for granted they provide the controller power needed at all levels from megawatts in cement production to milliwatts in wrist watches other examples are legion from the domestic kitchen to public utilities the modern electrical drive is a complex item comprising a controller a static converter and an electrical motor some can be programmed by the user some can communicate with other drives semiconductor switches have improved intelligent power modules have been introduced all of which means that control techniques can be used now that were unimaginable a decade ago nor has the motor side stood still high energy permanent magnets semiconductor switched reluctance motors silicon micromotor technology and soft magnetic materials produced by powder technology are all revolutionising the industry but the electric drive is an enabling technology so the revolution is rippling throughout the whole of industry

Electric Motors and Drives

2013-10-22

this book presents papers covering a wide spectrum of theory and practice deeply rooted in engineering problems at a high practical and theoretical level the contents explore theory control systems and applications the heart of the matter in electrical drives

Modern Electrical Drives

2013-06-29

suitable for undergraduate courses on electrical drives the contents in this book constitute a mix of modern and conventional topics such as solar powered drives modern traction drives and energy conservation in electrical drives have been covered for the first time in a book of this level a large number of solved and unsolved problems are included

Recent Developments of Electrical Drives

2007-06-08

a guide to drives essential to electric vehicles wind turbines and other motor driven systems analysis and control of electric drives is a practical and comprehensive text that offers a clear understanding of electric drives and their industrial applications in the real world including electric vehicles and wind turbines the authors noted experts on the topic review the basic knowledge needed to understand electric drives and include the pertinent material that examines dc and ac machines in steady state using a unique physics based approach the book also analyzes electric machine operation under dynamic conditions assisted by space vectors the book is filled with illustrative examples and includes information on electric machines with interior permanent magnets to enhance learning the book contains end of chapter problems and all topics covered use computer simulations with matlab simulink and sciamble workbench software that is available free online for educational purposes this important book explores additional topics such as electric machines with interior permanent magnets includes multiple examples and end of chapter homework problems provides simulations made using

matlab simulink and sciamble workbench free software for educational purposes contains helpful presentation slides and solutions manual for instructors simulation files are available on the associated website for easy implementation a unique feature of this book is that the simulations in sciamble workbench software can seamlessly be used to control experiments in a hardware laboratory written for undergraduate and graduate students analysis and control of electric drives is an essential guide to understanding electric vehicles wind turbines and increased efficiency of motor driven systems

Fundamentals of Electrical Drives

1995

wind turbine gearboxes present major reliability issues leading to great interest in the current development of gearless direct drive wind energy systems offering high reliability high efficiency and low maintenance developments in these direct drive systems point the way to the next generation of wind power and electrical drives for direct drive renewable energy systems is an authoritative guide to their design development and operation part one outlines electrical drive technology beginning with an overview of electrical generators for direct drive systems principles of electrical design for permanent magnet generators are discussed followed by electrical thermal and structural generator design and systems integration a review of power electronic converter technology and power electronic converter systems for direct drive renewable energy applications is then conducted part two then focuses on wind and marine applications beginning with a commercial overview of wind turbine drive systems and an introduction to direct drive wave energy conversion systems the commercial application of these technologies is investigated via case studies on the permanent magnet direct drive generator in the zephyros wind turbine and the archimedes wave swing aws direct drive wave energy pilot plant finally the book concludes by exploring the application of high temperature superconducting machines to direct drive renewable energy systems with its distinguished editors and international team of expert contributors electrical drives for direct drive renewable energy systems provides a comprehensive review of key technologies for anyone involved with or interested in the design construction operation development and optimisation of direct drive wind and marine energy systems an authoritative guide to the design development and operation of gearless direct drives discusses the principles of electrical design for permanent magnet generators and electrical thermal and structural generator design and systems integration investigates the commercial applications of wind turbine drive systems

Analysis and Control of Electric Drives

2020-08-27

provides broad insights into problems of coding control algorithms on a dsp platform includes a set of simulink simulation files source codes which permits readers to envisage the effects of control solutions on the overall motion control system bridges the gap between control analysis and industrial practice

Electrical Drives for Direct Drive Renewable Energy Systems

2013-03-25

in this book fundamentals of electrical drives are discussed keeping in mind the students of electrical engineering dynamics of electrical drives characteristics of dc and ac motors while starting running and braking determination of rating and heating of motors are described in detail drives used in various industries are discussed in a separate chapter industrial applications solved examples and problems are given at the end of most of the chapters the book acquaints the students with the recent trends in the development of electric motors used as prime movers in electric drive systems the chapter on introduction to solid state controlled drives has been expanded to include sections on increasingly used brushless dc motors and switched reluctance motors a separate chapter on the more commonly used position control drive motors namely stepper motors has been also incorporated amazon in

Digital Control of Electrical Drives

2008-11-01

a timely introduction to current research on pid and predictive control by one of the leading authors on the subject pid and predictive control of electric drives and power supplies using matlab simulink examines the classical control system strategies such as pid control feed forward control and cascade control which are widely used in current practice the authors share their experiences in actual design and implementation of the control systems on laboratory test beds taking the reader from the fundamentals through to more sophisticated

design and analysis the book contains sections on closed loop performance analysis in both frequency domain and time domain presented to help the designer in selection of controller parameters and validation of the control system continuous time model predictive control systems are designed for the drives and power supplies and operational constraints are imposed in the design discrete time model predictive control systems are designed based on the discretization of the physical models which will appeal to readers who are more familiar with sampled data control system soft sensors and observers will be discussed for low cost implementation resonant control of the electric drives and power supply will be discussed to deal with the problems of bias in sensors and unbalanced three phase ac currents brings together both classical control systems and predictive control systems in a logical style from introductory through to advanced levels demonstrates how simulation and experimental results are used to support theoretical analysis and the proposed design algorithms matlab and simulink tutorials are given in each chapter to show the readers how to take the theory to applications includes matlab and simulink software using xpc target for teaching purposes a companion website is available researchers and industrial engineers and graduate students on electrical engineering courses will find this a valuable resource

Basics of Electrical Drives

2015

in chaos in electric drive systems analysis control and application authors chau and wang systematically introduce an emerging technology of electrical engineering that bridges abstract chaos theory and practical electric drives the authors consolidate all important information in this interdisciplinary technology including the fundamental concepts mathematical modeling theoretical analysis computer simulation and hardware implementation the book provides comprehensive coverage of chaos in electric drive systems with three main parts analysis control and application corresponding drive systems range from the simplest to the latest types dc induction synchronous reluctance switched reluctance and permanent magnet brushless drives the first book to comprehensively treat chaos in electric drive systems reviews chaos in various electrical engineering technologies and drive systems presents innovative approaches to stabilize and stimulate chaos in typical drives discusses practical application of chaos stabilization chaotic modulation and chaotic motion authored by well known scientists in the field lecture materials available from the book's companion website this book is ideal for researchers and graduate students who specialize in electric drives mechatronics and electric machinery as well as those enrolled in classes covering advanced topics in electric drives and control engineers and product designers in industrial electronics consumer electronics electric appliances and electric vehicles will also find this book helpful in applying these emerging techniques lecture

materials for instructors available at wiley.com/go/chau_chaos

PID and Predictive Control of Electrical Drives and Power Converters using MATLAB / Simulink

2014-12-17

electric drives and electromechanical devices applications and control second edition presents a unified approach to the design and application of modern drive system it explores problems involved in assembling complete modern electric drive systems involving mechanical electrical and electronic elements this book provides a global overview of design specification applications important design information and methodologies this new edition has been restructured to present a seamless logical discussion on a wide range of topical problems relating to the design and specification of the complete motor drive system it is organised to establish immediate solutions to specific application problem subsidiary issues that have a considerable impact on the overall performance and reliability including environmental protection and costs energy efficiency and cyber security are also considered presents a comprehensive consideration of electromechanical systems with insights into the complete drive system including required sensors and mechanical components features in depth discussion of control schemes particularly focusing on practical operation includes extensive references to modern application domains and real world case studies such as electric vehicles considers the cyber aspects of drives including networking and security

Chaos in Electric Drive Systems

2011-03-31

Electric Drives: Concepts & Appl, 2/E

1996

Electric Drives and Electromechanical Systems

2019-10-19

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